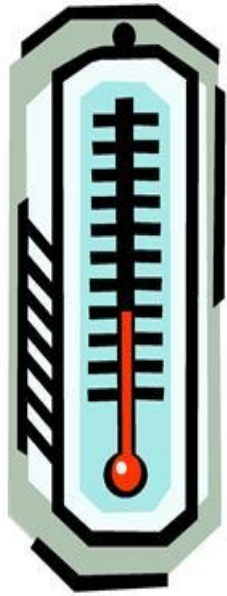


# Vaccine Storage & Handling



**AIM**  
for  
**40F<sup>0</sup>**



**Los Angeles County  
Immunization Program**





# Objectives

- Describe current vaccine storage and handling recommendations
- Explain the importance of maintaining the “cold chain”
- Identify preventative measures to maintain refrigerator and freezer temperatures
- List steps to protect vaccine in the event of a power outage or emergency





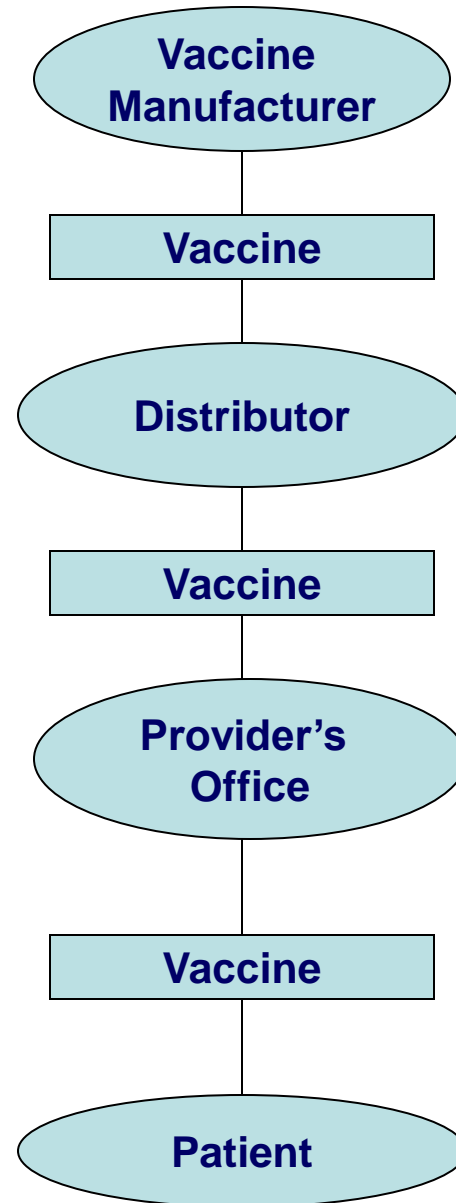
# Importance of Vaccine Protection

- Vaccines are fragile and must be kept at recommended temperatures at all times to maintain potency
- Vaccines are expensive
- Mishandled vaccines increase the risk that recipients will not be protected against vaccine-preventable diseases



# The “Cold Chain”

- Vaccines must be stored properly from the time they are manufactured until they are administered to your patients
  - Manufacturer to distributor
  - Distributor to office
  - Office to patient





# Common Errors

- Allowing vaccine to expire without notifying IP or VFC
- Not storing the vaccine immediately after delivery
- Not setting a lower alarm on electronic monitoring systems
- Confusing negative and positive temperatures
- Confusing Fahrenheit and Celsius





# Common Errors (cont'd)

- Documenting incorrect temps and not realizing they are wrong
- Not responding to out-of-range temps
- Not using logs that show out-of-range temps
- Writing down the same temperature day after day
- Unplugging the storage unit



# Consequences of Storage and Handling Errors

- Patient care, risk and liability
  - A patient is not fully protected if they were immunized with vaccine not stored correctly
- Vaccine Cost
  - Replacement vaccine costs are burdensome in terms of money and time
- Loss of trust
  - Can a practice afford the loss of a patient's and confidence?





# The Cost of Revaccination

**When you catch it**



**When you don't catch it**



# Vaccine Losses Are Costly

10 doses of each  
recommended  
pediatric vaccine  
plus 2 combination  
vaccines equals  
**\$8,234.50**



# How Much Money is in Your Storage Unit?



Mercedes C-Class





# What can you buy with \$28,000

McKesson Specialty Care Dist.  
3775 SEAPORT BLVD.  
WEST SACRAMENTO, CA 95031

## Packing Slip

This is not an invoice

Page 1 of 1

### Ship-to:

CALIFORNIA FAMILY CARE-NECC  
1414 S. GRAND AVE.  
LOS ANGELES, CA 90015  
(213) 743-9009-2

### Grantee:

CALIFORNIA DEPT HLTH SRVS.  
IMMUNIZATION PROGRAM  
850 MARINA BAY PARKWAY, BUILDING P  
RICHMOND, CA 94804  
(510) 546-3755

Provider PIN: CAA070759  
Delivery No.: 201467579  
Ship Date: 07/12/2011  
Customer Contact: CINDY PENA

Internal use only



NDC	Material No.	Customer P.O.	Material Description Manufacturer	MFR Lot#	Exp. Date	Order Qty	Ship Qty	Unit Price	Extended Price
00305-1071-02	5002500	VM-915745	PCV13; 5YR; 10-pack WYETH-AYERST	E32475	09/30/2012	120	120	\$97.21	\$11,665.20
42281-0569-05	5002531	VM-915744	MCV4; SDV; 5-pack SANOFI PASTEUR INC	U3338AA	01/10/2013	210	210	\$99.00	\$20,790.00
Total						330	330		\$28,910.40

This vaccine was purchased with public (state, local, and/or federal) funds and may be administered only to patients eligible to receive publicly-funded vaccination.

If you have questions about your order, or to retrieve a pedigree document for Rx product received on this packing list, please contact your Immunization Program to get assistance.

**\*\*\*IMPORTANT\*\*\***  
Never reject vaccine delivery or discard vaccine shipments without first contacting your state/local immunization program.

Please carefully review this Packing Slip to make sure doses shipped match information stated on the slip.  
**SHIPMENT DISCREPANCIES** - If an excess or shortage is noted, please contact your state/local immunization program listed above under "Grantee." Your state/local immunization program will work with McKesson to correct the issue.

Please have the following information ready when you call your state/local immunization program.  
• Product name and description, Item NDC#, Excess or shortage amount, Delivery No., Provider PIN #



**\$28,9190**

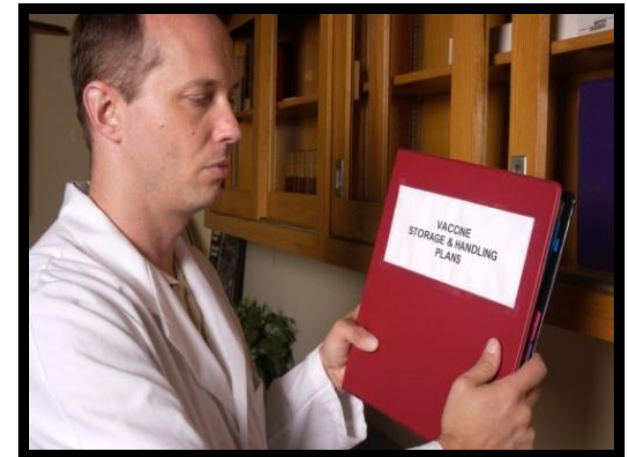


COUNTY OF LOS ANGELES  
**Public Health**

# Vaccine Storage and Handling Guidelines



- Develop and maintain detailed written Storage & Handling procedures
  - Daily storage and handling activities
  - Emergency relocation plan
  - Inventory control
  - Prevent vaccine waste
- Assign storage & handling responsibilities to 1 person and designate a back-up person



# Vaccine Storage and Handling Guidelines



- Provide annual training on vaccine storage and handling for all staff (clinician, medical assistants, receptionist, janitor, etc.)
  - Review policy annually and new employee orientation
- Identify an alternative storage site in case of an emergency e.g. hospital pharmacy





# Vaccine Coordinator Responsibilities

- Ordering vaccines
- Overseeing proper receipt and storage of vaccines
- Organizing vaccines in storage unit
- Temperature monitoring of storage unit(s)
- Recording temperature
- Daily physical inspection of unit
- Rotating stock
- Monitoring expiration dates and ensuring expired vaccine is removed from the storage unit and not used





# Vaccine Coordinator Responsibilities

- Responding to potential temperature excursions;
- Overseeing proper vaccine transport;
- Maintaining all appropriate vaccine storage and handling documentation, including temperature-excursion responses;
- Maintaining storage equipment and records;
- Maintaining proper documentation for the Vaccines for Children (VFC) program in participating clinics; and,
- Ensuring that designated staff is adequately trained.



# Routine Storage and Handling Procedures



Routine storage and handling procedures should include:

- Roles and responsibilities of vaccine coordinator and alternate
- Receiving vaccine shipments
- Vaccine storage unit temperature monitoring
- Responding to vaccine storage and handling problems such as, potentially compromised vaccines
- Transporting and receiving vaccine shipments
- Handling vaccine prior to administration
- Immunization Program or VFC contacts





# Emergency Procedures

Emergency vaccine retrieval procedures should include up-to-date information regarding procedures to follow to protect vaccines as quickly as possible. The policy should include: when a potentially compromising situation occurs.

- Emergency staff contact list in order of contact preference.
- Alternate vaccine storage facility or facilities.
- Protocols for transporting vaccines to and from the alternate vaccine storage facility
- Storage unit specifications





# Emergency Procedures

## *Storage and Handling Plans*

### Vaccine Storage and Handling Toolkit National Center for Immunization and Respiratory Diseases

- **Written instructions for entering your facility and vaccine storage spaces in an emergency if the building is closed.** These instructions should include the building security/after-hours access procedure, a floor diagram, and the locations of the following:
  - Alarms (including instructions for use)
  - Doors
  - Flashlights
  - Spare batteries
  - Light switches
  - Keys
  - Locks
  - Circuit breakers
  - Packing materials
- **Appropriate packing materials to safely transport or temporarily store vaccine.** Vaccine manufacturers do not recommend reuse of shipping materials, including coolant packs and shipping containers, to further transport vaccine products. Improper repackaging using these materials and improper transportation could negatively impact the vaccine.

Appropriate materials may include portable actively or passively cooled refrigerator/freezer units, hard-sided insulated containers, "conditioned" coolant packs that are cold or frozen (depending on the type of vaccine), and a calibrated thermometer for each container (see [Packing Vaccines and Diluents for Transport](#) in the [Vaccine Transport](#) section). There should be an adequate supply of packing materials/containers on hand for the facility's largest annual inventory. In situations where an alternate vaccine storage facility with a back-up generator cannot be identified within a reasonable distance, maintain the appropriate packing materials to store vaccines temporarily and safely at your facility. Record the names and contact information for sources of these materials.

- **Written protocol for vaccine packing.** Each facility should develop its own standard operating procedures (SOPs) for packing vaccines. These instructions should be readily available for staff unfamiliar with vaccine packing procedures. Key steps that should be reflected in all SOPs are:
  - Open the refrigerator and/or freezer doors only when absolutely necessary and only after you have made all preparations for packing and moving the vaccines to an alternate storage facility.
  - Use proper packing materials and procedures for refrigerated and frozen vaccines (see [Packing Vaccines and Diluents for Transport](#) in the [Vaccine Transport](#) section for general guidelines).



# What's wrong with this picture?



# Store All Vaccine Appropriately



- Live vaccines
  - Tolerate freezing (except LAIV and rotavirus)
  - Live viruses deteriorate rapidly after removal from the refrigerator/freezer
- Inactivated vaccines
  - Inactivated by freezing
  - Tolerate short times out of the refrigerator
- Rotavirus, MMR, MMRV, & HPV vaccines must be protected from light



# Store All Vaccine Appropriately



# Vaccine Storage Equipment

Be sure your storage unit is:

- In good working order
- Able to maintain required temperatures year round
- Dedicated to storage of vaccines; **No food!**





# Storage Units



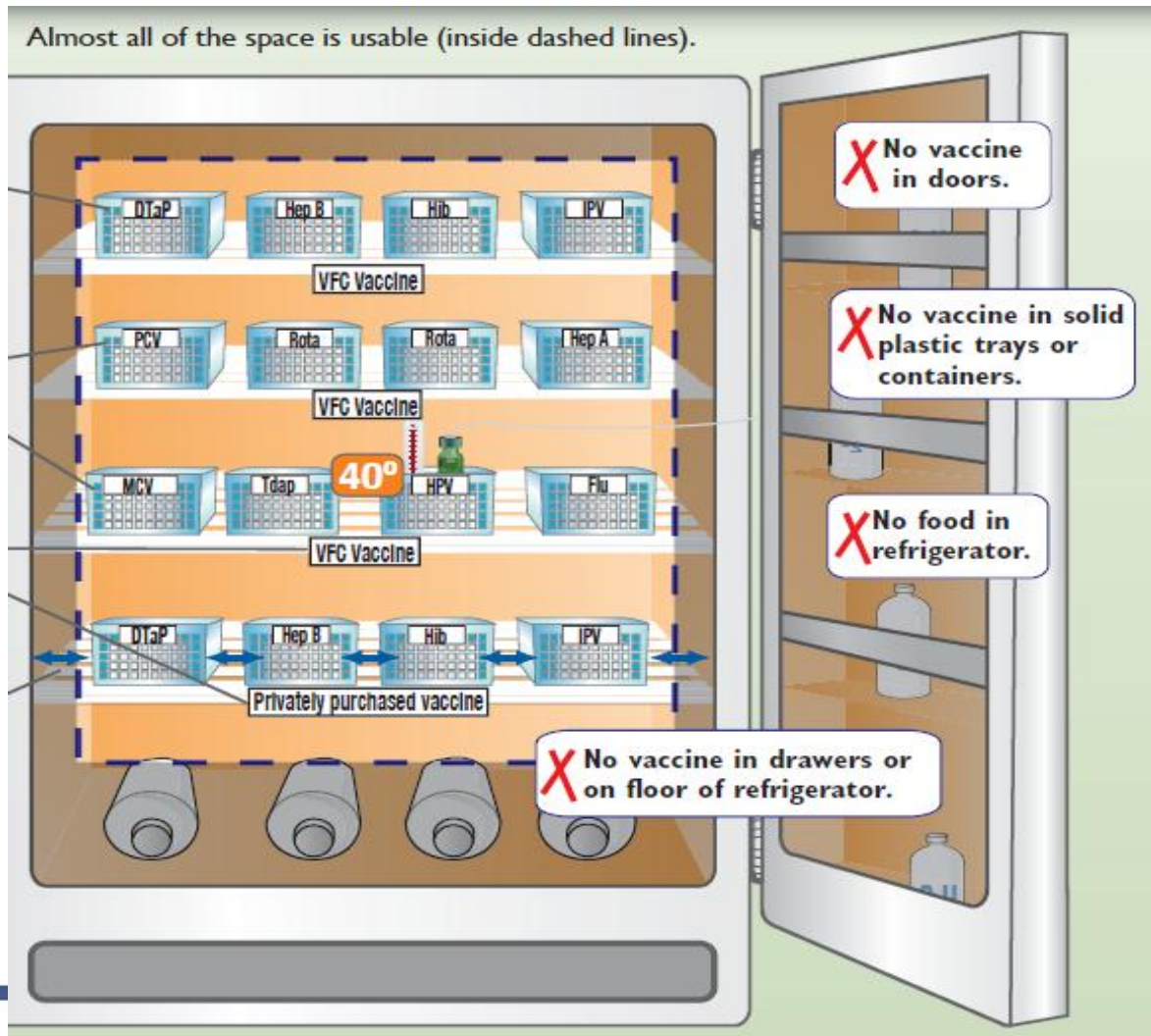
**Stand-alone refrigerators & freezers**



**Pharmacy-grade Combination Unit**

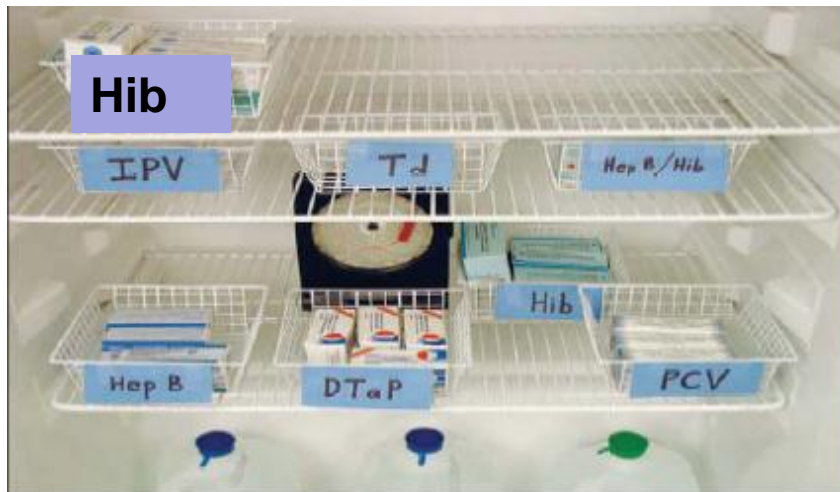


# Refrigerator Vaccine Storage

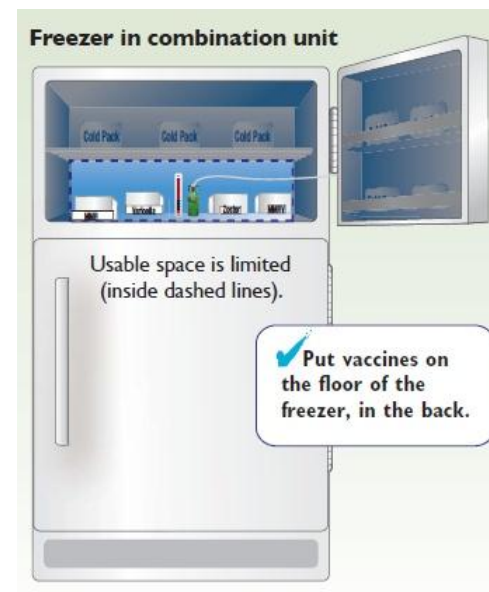
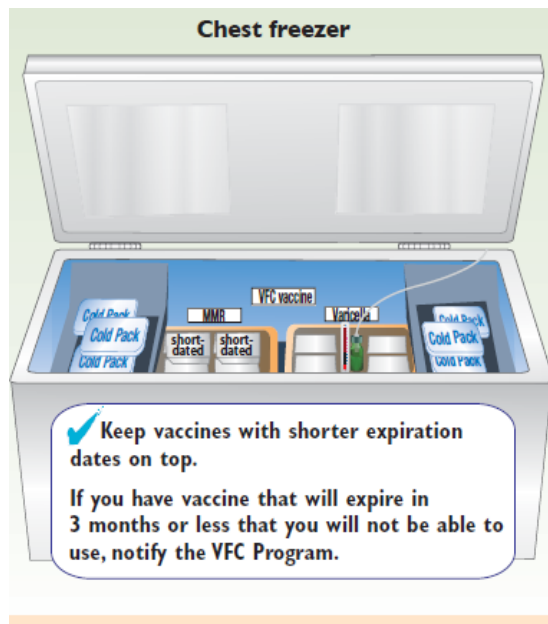
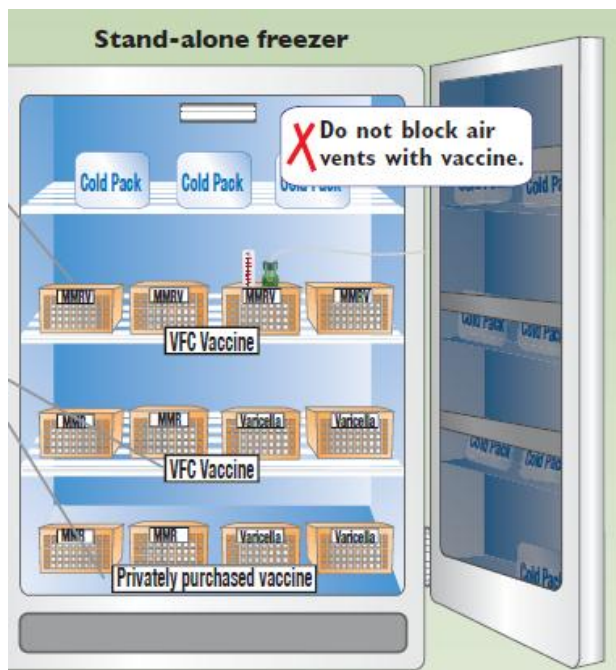




# Proper Vaccine Storage



# Freezer Vaccine Storage



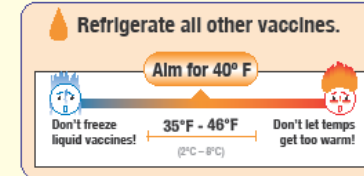
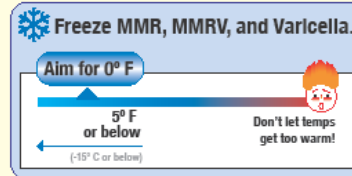
# Vaccine Storage Equipment

If a combination unit is used, each compartment should have its own exterior door and thermostat

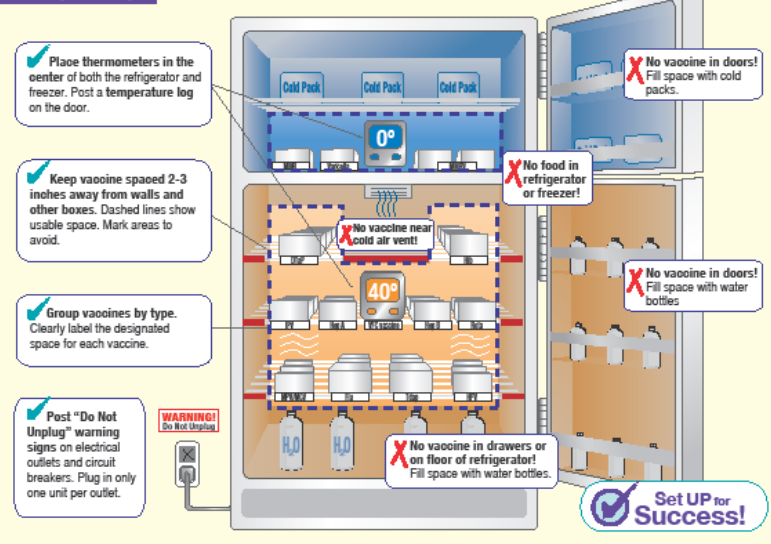
## Vaccine Storage

Combination Refrigerator/Freezer

### 1. Proper Temperatures



### 2. Proper Set Up



### 3. Proper Management

#### Monitor temperatures!

- Use only **certified thermometers** in accordance with National Institute of Standards and Technology (NIST). If your thermometer uses batteries, replace them every 6 months.
- Check and record refrigerator and freezer temperatures twice a day, first thing in the morning and last thing at the close of business. VFC temperature logs must be kept for a period of 3 years. If the temperature is out of range, **immediately contact the VFC Program**.
- Make sure that the door is shut.

#### Monitor capacity—especially during flu season!

- Combination units are acceptable for the storage of minimal quantities of vaccine as long as vaccines are always stored properly within usable space. New VFC providers and providers receiving more than 2,000 doses of vaccine annually may not use combination units. Check with your VFC representative for specific criteria.
- Inventory vaccine and ensure that there is enough space in refrigerator and freezer before ordering.

#### Maintain and rotate stock!

- Rotate vaccine stock by placing shorter expiration dates in front. Call VFC if you have any vaccine that will expire within 3 months.
- Keep vaccines in original packaging until it is time to use it.
- Keep VFC vaccines separate from privately purchased vaccines.
- Have an emergency plan for extended power outages and freezer or refrigerator malfunctions.
- Designate one fully trained staff member to be the primary vaccine coordinator and at least one person to be back-up. Ensure ongoing training.

#### Call VFC about any problems!

If you have any problems with your refrigerator or freezer:

- Keep the refrigerator and freezer doors shut
- Notify the VFC Program

Vaccines for Children Program (877) 243-8832  
VFC Field Representative



GELES  
health



# Vaccine Appearance

- Some vaccines may show evidence of altered potency, e.g. clumping



Properly stored vaccine  
Full potency



Improperly stored vaccine  
Diminished potency





# Vaccine Storage Equipment

DO NOT USE A DORMITORY UNIT





# Vaccine Storage

Never store  
vaccines in the  
door of the  
refrigerator or  
freezer





# Certified Calibrated Thermometers



Continuous graphic thermometer



Digital Thermometer



Dial Thermometer

Use only certified,  
calibrated thermometers



# Other Thermometers

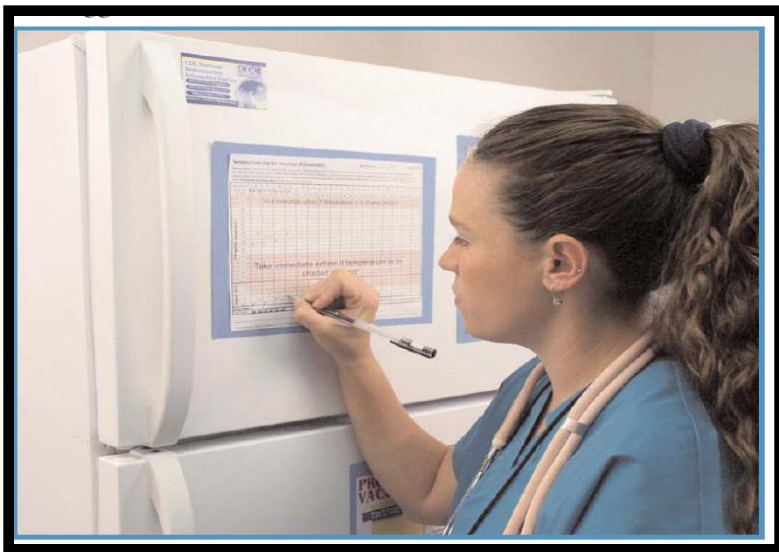


**Digital thermometer with probe**





# Temperature Monitoring



Record temperatures twice daily and  
Store temperature logs for at least 3 years





# Temperature Logs

## F° Refrigerator Temperature Log


**Record temperatures twice a day.**

- Write your initials and the a.m. or p.m. time.
- Write an "X" next to the current temperature.

**If the temperature is unacceptable (above 46°F or below 35°F), write the temperature in the space provided\* and Take Action! (See below.)**

- At the end of the month, file this log and keep it for 3 years.

Month/Year \_\_\_\_\_  
Days 1-15



www.edz.org

Staff Initials	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15			
Day of Month																																
Time																																
	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm		

**Danger! Temperatures above 46°F are too warm! Write any unacceptable temperature on the lines below\* and call your VFC Rep immediately!**

46°F																														
45°F																														
44°F																														
43°F																														
42°F																														
41°F																														
40°F																														
39°F																														
38°F																														
37°F																														
36°F																														
35°F																														

**Danger! Temperatures below 35°F are too cold! Write any unacceptable temperature on the lines below\* and call your VFC Rep immediately!**

\* Write any unacceptable temps (above 46° or below 35°).

**Take Action!**  
If temperature is too cold or too warm (above 46°F or below 35°F):

- Put a "Do Not Use Vaccine" sign on the refrigerator.
- Alert your supervisor immediately.
- Contact your VFC Representative.
- Record the actions you take.

VFC Representative: \_\_\_\_\_

VFC Program Office: 1-877-243-8832

**Record actions taken for unacceptable temperatures.**

Date	Action

IMA 6827-Refrigerator (9/10)

## F° Freezer Temperature Log


**Record temperatures twice a day.**

- Write your initials and the a.m. or p.m. time.
- Write an "X" next to the current temperature.

**If the temperature is unacceptable (above 5°F), write the temperature in the space provided\* and Take Action! (See below.)**

- At the end of the month, file this log and keep it for 3 years.

Month/Year \_\_\_\_\_  
Days 1-15



www.edz.org

Staff Initials	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15			
Day of Month																																
Time																																
	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm		

**Danger! Temperatures above 5°F are too warm! Write any unacceptable temperature on the lines above\* and call your VFC Rep immediately!**

5°F																														
4°F																														
3°F																														
2°F																														
1°F																														
0°F																														
-1°F																														
-2°F																														
-3°F																														
-4°F																														
-5°F to -30°F and colder																														

\* Write any unacceptable temps (above 5°F).

**Take Action!**  
If temperature is too warm (above 5°F):

- Put a "Do Not Use Vaccine" sign on the refrigerator.
- Alert your supervisor immediately.
- Contact your VFC Representative.
- Record the actions you take.

VFC Representative: \_\_\_\_\_

VFC Program Office: 1-877-243-8832

**Record actions taken for unacceptable temperatures.**

Date	Action

IMA 6827-Freezer (9/10)



# F° Refrigerator Temperature Log



Month/Year \_\_\_\_\_  
Days 1-15



## Record temperatures twice a day.

1. Write your initials and the a.m. or p.m. time.
2. Write an "X" next to the current temperature.  
If the temperature is unacceptable (above 46°F or below 35°F), write the temperature in the space provided\* and Take Action! (See below.)
3. At the end of the month, file this log and keep it for 3 years.

Staff Initials															
Day of Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Time															
	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am

**Danger! Temperatures above 46°F are too warm!** Write any unacceptable temperature on the lines below\* and call your VFC Rep Immediately!



**Danger! Temperatures below 35°F are too cold!** Write any unacceptable temperature on the lines below\* and call your VFC Rep Immediately!

\* Write any unacceptable temps (above 46° or below 35°).

32

## Take Action!

If temperature is too cold or too warm (above 46°F or below 35°F):

1. Put a "Do Not Use Vaccine" sign on the refrigerator.
2. Alert your supervisor immediately.
3. Contact your VFC Representative.
4. Record the actions you take.

VFC Representative:

VFC Program Office: 1-877-243-8832

## Record actions taken for unacceptable temperatures.

Date

Action

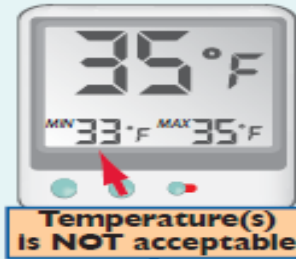
01/05/13 8am. Temp 32F. Contacted the Immunization Program Customer Services Unit. Instructed not to use vaccine until further notice. S. Que, MA



Read the **MIN** and **MAX** temperatures.



OR



Do nothing.

Write the **unacceptable temperature** in the space provided.

Write **MIN** or **MAX** next to the unacceptable temperature.

Immediately follow the steps under *Take Action!*

\* Write any unacceptable temps (above 46° or below 35°)

MIN 33°

**Take Action!**

If temperature is too cold or too warm (above 46°F or below 35°F):

1. Put a "Do Not Use Vaccine" sign on the refrigerator.
2. Alert your supervisor immediately.
3. Contact your VFC Representative.
4. Record the actions you take.

At the end of every clinic day repeat steps ② ③ ④.

At the end of the day press the *Memory Clear* button on the thermometer.



# MIN and MAX refrigerator temperatures





Read the **MIN** and **MAX** temperatures.



Temperatures are acceptable

OR



Temperature(s) is NOT acceptable

Do nothing.

Write the **unacceptable temperature** in the space provided.

Write **MIN** or **MAX** next to the unacceptable temperature.

Immediately follow the steps under *Take Action!*

Write any unacceptable temps (above 5°F.) Then take action!

Max: 6°

### Take Action!

If temperature is too warm (above 5°F):

1. Put a "Do Not Use Vaccine" sign on the freezer.
2. Alert your supervisor immediately.
3. Contact your VFC Representative.
4. Record the actions you take..

At the end of every clinic day repeat steps ② ③ ④ .

At the end of the day press the *Memory Clear* button on the thermometer.



# MIN and MAX freezer temperatures



# SCENARIO

The last recorded refrigerator temperature at 5:00 p.m. was 40° F. When you arrive to the clinic at 8:30 a.m., you notice the refrigerator temperature is 56° F. What would you do?





# Receiving Vaccine Shipments





# Vaccine Shipments

- Examine shipment on arrival
- Check contents against packing slip
- Check vaccine expiration dates
- Examine contents for damage
- Check shipping date
  - $\leq 3$  days for Varicella
  - $\leq 48$  hours for refrigerated vaccines
- Check Temperature Monitor (only refrigerated vaccines)
- Store vaccine in the appropriate manner





# Shipping Discrepancies

- *Never* reject a vaccine delivery
- *Never* discard a vaccine shipment
- Contact your Customer Support Services for all discrepancies and be ready to give the following information:
  - product name
  - excess/shortage amount
  - reference number
  - PIN #





# 3M MonitorMark Temperature Indicator



Figure 1



Figure 2





# 3M MonitorMark for MMR



Figure 1



Figure 2





# FREEZEmarker Indicator



1. Press the FREEZEmarker indicator with your thumb and compare it to the chart.
2. If the indicator shows a white checkmark, as shown here, store the vaccines as instructed and begin use.
3. If the indicator is white and cloudy, store the vaccines and call your Area Field Unit *right away* for further instruction.

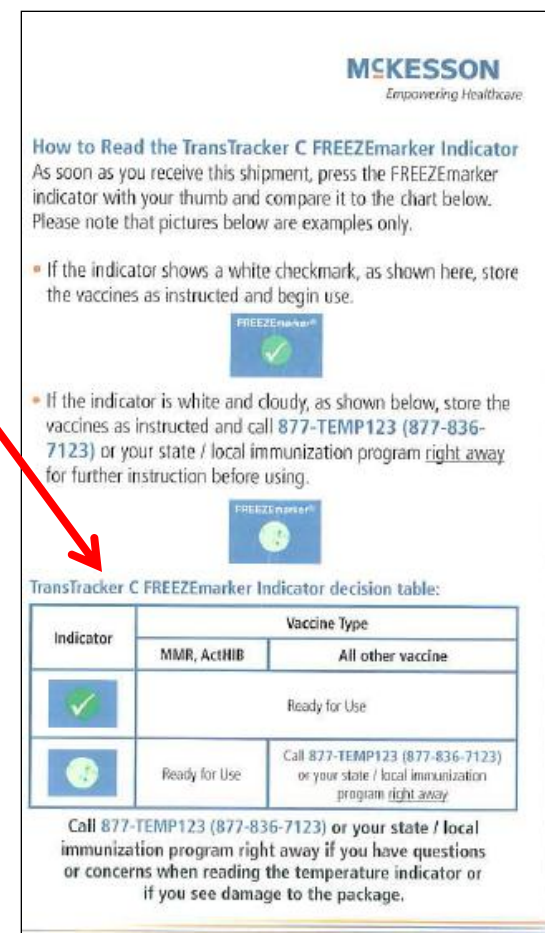
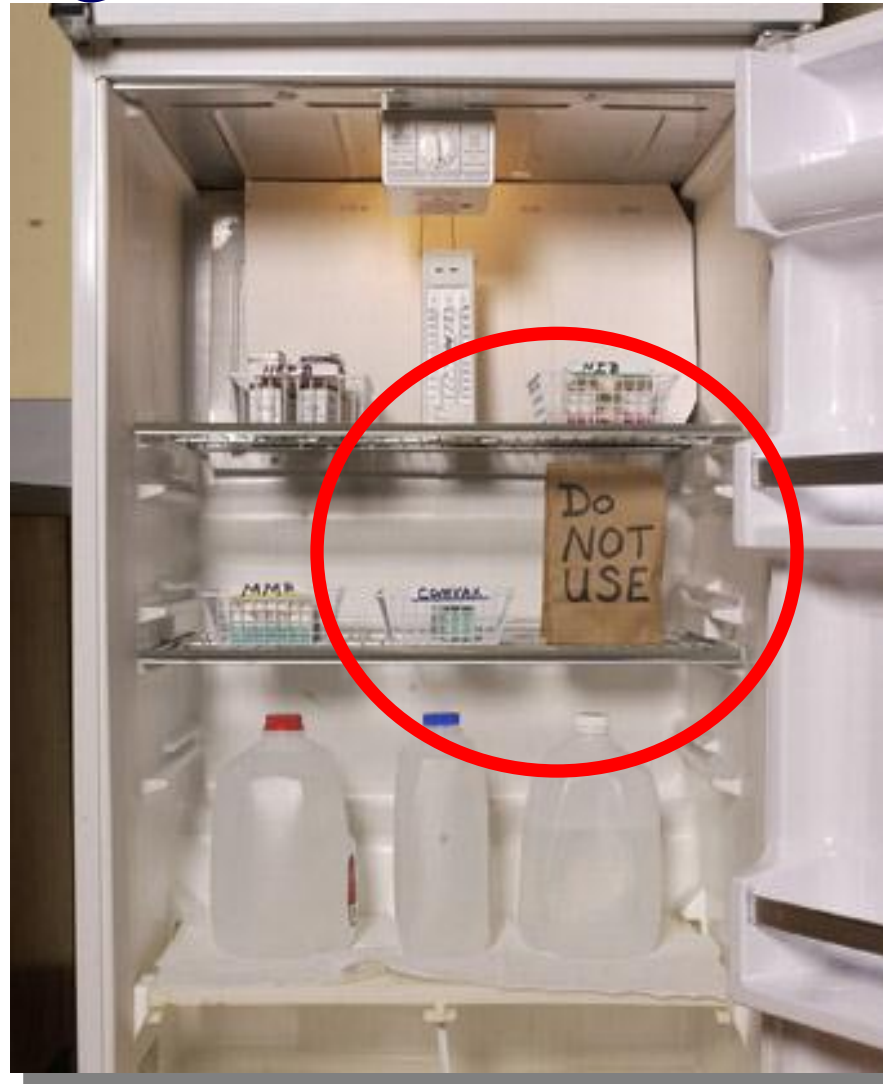


Figure 1



Figure 2

# Isolate Questionable Vaccines





# Vaccine Inventory Log

- Name of vaccine
- Number of doses
- Vaccine manufacturers
- Lot numbers
- Expiration date



# Vaccine Inventory Control



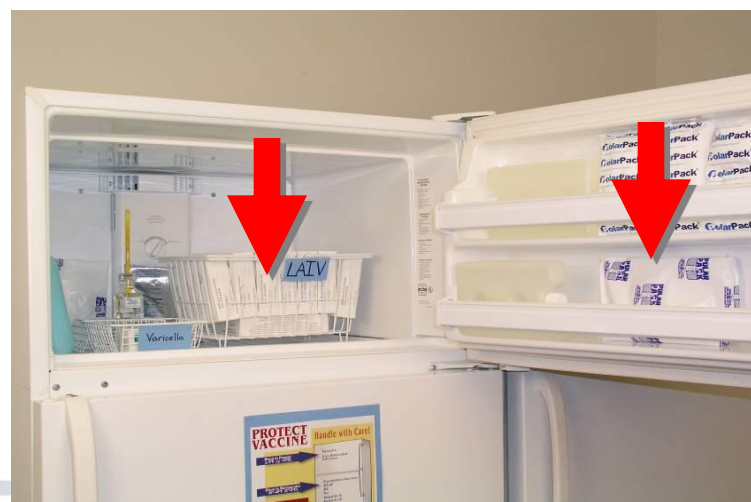
- Conduct a monthly vaccine inventory
- Provides clinic with an accurate count of their vaccine
  - Avoid stocking excessive vaccine supplies
- Monitor expiration dates
- Rotate stock to avoid waste (Put shortest dated vaccine in front)
- Never use expired vaccine or diluent
- Limit access to authorized personnel only





# Preventive Measures

- Stock vegetable bins with bottles of water or cold packs to stabilize refrigerator temperatures
- Keep extra frozen cold packs or blue ice in the freezer





# Preventive Measures

- Use a plug guard or safety-lock plug
- Post a warning sign at the plug and on the refrigerator
- Label fuses and circuit breakers
- Install a temperature alarm





# Bilingual “Do Not Unplug” Sticker

**WARNING**  
**DO NOT UNPLUG THE REFRIGERATOR/FREEZER  
OR TURN OFF THE CIRCUIT BREAKER.  
EXPENSIVE VACCINE IN STORAGE.**

  
**DO NOT UNPLUG!**

In event of electrical problem, immediately contact:



**ADVERTENCIA**  
**NO DESCONECTE EL REFRIGERADOR/  
CONGELADOR NI CORTE EL CIRCUITO.  
¡CONTIENE VACUNAS CARAS!**

  
**¡NO DESCONECTE!**

Si hay algún problema eléctrico, comuníquese con:







# Using Multi-dose Vials

- Dating multidose vials





# Multi-dose vs. Single-dose Vials

<b><u>Multi-dose vials</u></b> <b>(premixed)</b>	<b><u>Multi-dose vials</u></b> <b>(needs Reconstitution)</b>	<b><u>Single-dose vials</u></b>
<ul style="list-style-type: none"><li>- Contains a <b>Bacteriostatic</b></li><li>- Good until expiration date, unless contaminated</li></ul>	<ul style="list-style-type: none"><li>-Use reconstituted vaccine within interval specified by manufacturer</li><li>-After reconstitution, write new exp date on vial</li></ul>	<ul style="list-style-type: none"><li>-Once opened, use or discard by end of clinic day</li></ul>





# Reconstituting Vaccine

- Use the correct diluent
- Reconstitute vaccine immediately prior to use
- Do not allow vaccine and diluent to sit out for a long time before reconstituting
- Check expiration date of diluent and vaccine
- Consult package insert for life of vaccine once reconstituted

## Preparing Reconstituted Vaccines

### Before You Start

- Wash your hands.
- Gather alcohol pads, appropriate needle, and syringe.
- Get one dose each of vaccine and diluent.
- Check vaccine against physician's written order.
- Check that today's date is sooner than vaccine's and diluent's expiration dates.



### Mixing the Vaccine

- Remove plastic caps.
- Cleanse stoppers with alcohol pad and let dry.\*
- Assemble needle and syringe.
- Uncap needle.
- Hold diluent vial steady on the counter.
- Insert needle straight into the center of the vial stopper.
- Invert vial and pull needle back so the tip is in the liquid.
- Draw up all diluent into syringe and then withdraw needle.
- Hold vaccine vial steady on the counter.
- Insert needle into center of stopper.
- Inject diluent
- Holding vial and syringe together, shake to mix.



\*Be sure that MMR, Varicella and MMRV stoppers are thoroughly dry before drawing up doses. Alcohol may damage these live vaccines.

### Drawing Up the Vaccine

- Invert vial and pull needle back so the tip is in the liquid.
- Pull back on plunger and draw up **entire contents** of vial.
- Withdraw needle.
- Tap syringe and push out air.
- Recap the clean needle.
- Use reconstituted vaccine promptly.



www.eziz.org





## **Right Medication = Right Vaccine + Right Diluent**

<b>Vaccine</b>	<b>Diluent</b>	<b>Powder</b>
DTaP-IPV/Hib (Pentacel)	DTaP-IPV (sanofi)	Hib (ActHIB)
Hib (ActHIB)	0.4% Sterile saline (sanofi)	Hib (ActHib)
Hib (Hiberix)	0.9% Sterile saline (GSK)	Hib
MMR (MMR-II)	Sterile water (Merck)	MMR
MMRV (ProQuad)	Sterile water (Merck)	MMRV



# Right Medication = Right Vaccine + Right Diluent

Vaccine	Diluent	Powder
MenACWY <sub>CRM</sub> (Menveo)	MenCWY (Novartis)	MenA
MPSV4 (Menomune)	SDV - Distilled water (sanofi) MDV- Distilled water + thimerosal (sanofi)	MPSV4
RV1 (Rotarix)	Sterile water, calcium carbonate, and xanthan (GSK)	RV1
VAR (Varivax)	Sterile water (Merck)	VAR
ZOS (Zostavax)	Sterile water (Merck)	ZOS



# **Time limits for using vaccines after reconstitution**

- Varicella - 30 mins or less (protect from light)
- Zostavax - 30 mins or less (protect from light)
- MMRV - 30 mins or less (protect from light)
- MMR - 8 hours or less (protect from light)
- Rotarix - 24 hours or less
- Pentacel - 30 mins or less





# Diluent

- When transferring lyophilized vaccine such as Varicella or MMR, remember to transfer the diluent as well
- If lyophilized vaccine is wasted or expired do not waste the diluent.
  - Diluent has a longer shelf-life than vaccines





# Handle Vaccines with Care



- Do NOT refreeze vaccines after thawing
  - Unreconstituted varicella and MMRV may be stored for up to 72 hours at 35°-46°F (2° -8° C)
  - Unreconstituted zoster vaccine may not be stored in this manner
  - MMR can be stored at refrigerated temperatures
- Do NOT uncap vials until ready for use
- Remember, the clock is ticking once a lyophilized vaccine is reconstituted





# “Pre-filling” Syringes

- This practice is **strongly discouraged**
- May result in vaccine administration errors, wasted vaccine, and possible bacterial growth
- Use manufacturer-supplied prefilled syringes (e.g., flu outreach and back-to-school clinics)
- Syringes other than those filled by manufacturer should be discarded at end of clinic day
- Manufactured pre-filled syringes that have had the caps removed and a needle attached to the syringe should be discarded at the end of the day.





# Transporting Refrigerated Vaccines

## Transporting Refrigerated Vaccine

### Guidelines for vaccine transport and short-term storage

- The procedure below for packing vaccine will keep all vaccines (except varicella vaccine) within recommended temperatures for 12 hours during transport and/or storage at room temperatures (inside a car, building, etc.). It will also maintain recommended temperatures if the cooler is exposed to outside temperatures as low as -4°F for one of those 12 hours.
- If the vaccine will be stored in refrigerators after transport, be sure those refrigerators have maintained temperatures between 35°F and 46°F for at least 3 to 5 days.

### Assemble packing supplies

- Cooler.** Use hard plastic Igloo-type coolers. Attach a "Vaccines: Do Not Freeze" label to the cooler.
- "Conditioned" cold packs.** Condition frozen gel packs by leaving them at room temperature for 1 to 2 hours until the edges have defrosted and packs look like they've been "sweating." Cold packs that are not conditioned can freeze vaccine. **Do not use dry ice.**
- Thermometer.** Prepare the thermometer by placing it in the refrigerator at least 2 hours before you pack the vaccine.
- Packing material.** Use two 2-inch layers of bubble wrap. Not using enough bubble wrap can cause the vaccine to freeze.



### Pack vaccine

#### 1. Cold packs

Spread conditioned cold packs to cover only half of the bottom of the cooler.



#### 2. Bubble wrap & Thermometer

Completely cover the cold packs with a 2-inch layer of bubble wrap. Then, place the thermometer/probe on top of the bubble wrap directly above a cold pack.



#### 3. Vaccine

Stack layers of vaccine boxes on the bubble wrap. Do not let the boxes of vaccine touch the cold packs.



#### 4. Bubble wrap

Completely cover the vaccine with another 2-inch layer of bubble wrap.



#### 5. Cold packs

Spread "conditioned" cold packs to cover only half of the bubble wrap. Make sure that the cold packs do not touch the boxes of vaccine.



#### 6. Form & display

Fill the cooler to the top with bubble wrap. Place the thermometer's digital display and the Return or Transfer of Vaccines Report form on top. It's ok if temperatures go above 46°F while packing.



As soon as you reach the destination site, check the vaccine temperature. If the vaccine is:

- Between 35°F and 46°F, put it in the refrigerator.
- Below 35°F or above 46°F, contact your VFC Rep or the VFC program immediately at 1-877-243-8832. For H1N1 vaccine, call 1-888-867-6319. Then label the vaccine "Do Not Use" and put it in the refrigerator.

[www.ezix.org](http://www.ezix.org)

California Department of Public Health, Immunization Branch

PH1-983 (2/10)



COUNTY OF LOS ANGELES  
**Public Health**



# Transportation Supplies



Paper bags



Bubble Wrap

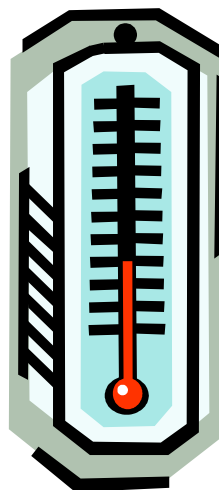


Vaccine

Ice Chest/Cooler



Gel packs



Thermometer





# Do not take vaccines home



# VFC Website – eziz.org



alifornia Vaccines for...



Page Safety



Google™ Custom Search



*A one-stop shop for immunization training and resources.*

Home

EZIZ Training

VFC Program

Storage & Handling

Resources

## Contact VFC

Phone: 1-877-243-8832

Business hours: 9-5

Fax: 1-877-329-9832

- ▶ Find a VFC field representative in your area
- ▶ Find other VFC provider offices in your area
- ▶ Send us your comments at [eziz@cdph.ca.gov](mailto:eziz@cdph.ca.gov)

Sign up to receive  
EZIZ news and  
VFC letters  
via email



## EZIZ Training

Find out more about each lesson below or [start lessons](#).

**NEW**

### Vaccine Inventory Management

#### Conducting a Vaccine Inventory (19 min.)

Identify vaccine brand name and packaging;  
Enter lot numbers, expiration dates,  
and total doses on hand on *VFC Inventory Form* for all VFC vaccines



### Vaccine Administration

#### Preparing Vaccines (25 min.)

Select vaccines based on physicians' orders;  
Identify expired vaccines;  
Mix, reconstitute, and draw up vaccines

#### Administering Vaccines (16 min.)

Identify correct needle lengths, insertion angles, and injection sites for intramuscular (IM) and subcutaneous (SC) injections;  
Administer IM and SC injections

### Storage and Handling\*

#### Storing Vaccines (20 min.)

Prepare refrigerators and freezers for vaccine storage;  
Store vaccines in refrigerators and freezers:

## Resources

### For Trainers

- ▶ EZIZ Promo Flyer
- ▶ EZIZ Quick-start Cards
- ▶ CAIR Tools for Trainers

### For Provider Offices

- ▶ **EZIZ Training now required for Annual VFC Recertification**
- ▶ CAIR Training
- ▶ Vaccine Administration Materials
- ▶ Storage and Handling Materials
- ▶ VFC Forms
- ▶ Flu and Disease Prevention
- ▶ For Staff and Patients
- ▶ Training by Other Organizations

Internet | Protected Mode: Off

English (U.S.)

50%



# CDC Vaccine Storage & Handling Guide



- Baskets with solid sides can be used to store vaccine
- Varicella-containing vaccines should not be stored in temperatures below - 58°F (-58°F and +5°F or -50°C and -15°C)
- *Do not* use dry ice to transport varicella-containing vaccines





# Vaccine Storage & Handling Resources

- CDC National Immunization Program  
<http://www.cdc.gov/vaccines/recs/storage/default.htm>
- Immunization Action Coalition (IAC)  
[www.immunize.org](http://www.immunize.org)
- Vaccine for Children (VFC) training website  
[www.eziz.org](http://www.eziz.org)
- B-71  
[www.publichealth.lacounty.gov/ip](http://www.publichealth.lacounty.gov/ip)





# Vaccine Storage & Handling Self Assessment Guide



## Vaccine Storage & Handling Self Assessment



**Instructions:** Complete the checklist below with all immunization staff to ensure your office is in compliance with Los Angeles County Immunization Program (LACIP) and Vaccines for Children (VFC) Vaccine Storage and Handling guidelines. New providers should use this checklist as a guide in preparing for the storage of VFC Vaccines. For questions or assistance, please contact your Area Field Unit.

<input checked="" type="checkbox"/>	VACCINE MANAGEMENT PRACTICES
<input type="checkbox"/>	1. Have <b>written</b> Policies and Procedures for vaccine storage and handling, including a plan for cold-chain problems (too hot, too cold, power failure) that are routinely reviewed with staff.
<input type="checkbox"/>	2. Have a <b>trained</b> person in-charge of the vaccines and a designated back-up person who is trained.
<input type="checkbox"/>	3. Have an appropriate refrigerator and freezer, defined as: <input type="checkbox"/> Meets VFC Storage and Handling requirements. <input type="checkbox"/> Has the capacity to store the <b>maximum</b> amount of vaccine needed annually ( <b>including Influenza season</b> ). <input type="checkbox"/> Is designated for the storage of vaccines (no food or drink).
<input type="checkbox"/>	4. Have a Calibrated Thermometer that has been certified is placed <b>centrally</b> in each unit. <input type="checkbox"/> The battery is changed every 6 months. <input type="checkbox"/> A back-up thermometer is located centrally in each unit and referenced, as needed.
<input type="checkbox"/>	5. Temperatures are logged at the <b>start and end of each business day</b> on <i>VFC Temperature Logs (IMM-682)</i> . <input type="checkbox"/> The refrigerator temperature is maintained between 35-46° F (2-8°C), ( <b>Aim for 40° F</b> ). <input type="checkbox"/> The freezer temperature is maintained below 5° F (-15°C), ( <b>Aim for 0° C</b> ). <input type="checkbox"/> If the temperature goes out of range, action is taken following clinic written Procedure. <input type="checkbox"/> The temperature logs are kept on site for 3 years.
<input type="checkbox"/>	6. Vaccine supply is kept to a minimum by ordering only the quantity needed as allowed by clinic VFC ordering frequency.
<input type="checkbox"/>	7. The refrigerator and freezer set up and the placement of vaccines is appropriate. <input type="checkbox"/> Vaccines are stored only on the shelves, in the center of the unit, and away from the walls and cold air vents (if using a household combination refrigerator). <input type="checkbox"/> Vaccines are kept in original manufacturer boxes and placed to allow air circulation around the boxes. <input type="checkbox"/> Stock is rotated so the vaccine with the earliest expiration date is placed in the front to be used first. <input type="checkbox"/> Water bottles are placed in the bottom of the refrigerator or door away from the air vents. <input type="checkbox"/> Frozen packs are in the freezer or door away from air vents.
<input type="checkbox"/>	8. A "Do Not Unplug" sign is next to the electrical outlet and circuit breaker box for the refrigerator and freezer.
<input type="checkbox"/>	9. An accurate vaccine inventory is maintained. <input type="checkbox"/> VFC vaccines are distinguished from privately purchased vaccines. <input type="checkbox"/> LACIP is notified <b>at least 3 months</b> before the vaccine expiration date if it cannot be used in time.
<input type="checkbox"/>	10. LACIP and VFC websites are accessed for important immunization and VFC communications, current forms, and immunization resources, <a href="http://www.publichealth.lacounty.gov/in">www.publichealth.lacounty.gov/in</a> and <a href="http://www.eziz.org">www.eziz.org</a> .

Rev. 12/30/10





# www.immunize.org/catg.d/p3036.pdf

## Don't Be Guilty of These Errors in Vaccine Storage and Handling

The following are frequently reported errors in vaccine storage and handling. Some of these errors are much more serious than others, but none of them should occur. Be sure your clinic or practice is not making errors such as these.

### Error #1: Designating only one person in the office to be responsible for storage and handling of vaccines, instead of a minimum of two.

It's important to train at least one back-up person to learn proper storage and handling of vaccines. The back-up person should be familiar with all aspects of vaccine storage and handling, including knowing how to handle vaccines when they arrive, how to properly record refrigerator and freezer temperatures, and what to do in case of an equipment problem or power outage.

### Error #2: Recording temperatures only once per day.

Temperatures fluctuate throughout the day. Temperatures in the refrigerator and freezer should be checked at the beginning and end of the day to determine if the unit is getting too cold or too warm. Ideally, you should have continuous thermometers that measure and record temperatures all day and all night. A less expensive alternative is to purchase maximum/minimum thermometers. It's also a good idea to record the room temperature on your temperature log in case there is a problem with the refrigerator or freezer temperature. This information may be helpful to the vaccine company's telephone consultant in ascertaining whether your vaccine can still be used.

### Error #3: Recording temperatures for only the refrigerator or freezer.

If your facility administers varicella vaccine, you should have thermometers in both the refrigerator and the freezer. Rather than buying cheap thermometers that may not accurately measure the temperature, buy quality thermometers that will last for years.

### Error #4: Documenting out-of-range temperatures on vaccine temperature logs and not taking action.

Documenting temperatures is not enough. Acting on the information is even more important! So, what should you do? Notify your supervisor whenever you have an out-of-range temperature. Safeguard your vaccines by moving them to a safer location and then determine if they are still viable. Check the condition of the unit for problems. Are the seals tight? Is there excessive lint or dust on the coils? After you have made the adjustment, document the date, time, temperature, what the problem was, the action you took, and the results of this action. Retest the temperature every two hours. Call maintenance or a repair person if the temperature is still out of range.

### Error #5: Throwing away temperature logs at the end of every month.

It's important that you keep your temperature logs for at least three years. As the refrigerator ages, you can trace increasing problems. If

temperatures have been documented out of range, you can determine how long this has been happening and take appropriate action. It's also a great way to lobby for a new refrigerator.

### Error #6: Storing vaccine in the wrong part of the refrigerator (e.g., vegetable bin, plastic container, the door, bottom, or near the cold air outlet from the freezer).

The temperature in these areas may differ significantly from the temperature in the body of the refrigerator. Always place vaccines on the shelves in open, labeled containers, so that air can circulate around the vaccines.

### Error #7: Storing varicella vaccine in a dorm-style refrigerator.

Varicella must be stored in a freezer that has its own external door separate from the refrigerator. No matter how hard you try to adjust the temperature to +5°F in a dorm-style refrigerator's freezer, you won't be able to reach this low temperature in the freezer, and you'll probably freeze the rest of your vaccines in the refrigerator!

### Error #8: Indwarily leaving the refrigerator or freezer door open or having inadequate seals.

Remember to close the unit doors tightly each time they open them. Also, check the seals on the doors on a regular schedule, and if there is any indication the door seal may be cracked or not sealing properly, have it replaced. The cost of replacing a seal is much less than replacing a box of pneumococcal conjugate or varicella vaccine.

### Error #9: Discarding multi-dose vials 30 days after they are opened.

Don't discard your vaccines prematurely. All multi-dose vials of vaccine have preservatives in them and can be used until the expiration date on the vial unless there is visible contamination. However, you must discard multi-dose vials of reconstituted vaccine (e.g., meningococcal, yellow fever) if they are not used within a defined period after reconstitution. Refer to the vaccine package inserts for additional information.

### Error #10: Not having emergency plans for a power outage or natural disaster.

Every clinic should have a written Disaster Recovery Plan that identifies a refrigerator with a back-up generator in which to store vaccine in the event of a power outage or natural disaster. Consider contacting a local hospital or similar facility to be your back-up location if you should need it.



www.immunize.org/catg.d/p3036.pdf • Item # P3036 (4/08)





# Take-Home Messages

- Colder is NOT better for inactivated vaccines.
- Check the temperature twice a day
- Out of range temperature readings require IMMEDIATE action
- Maintain the cold chain at all times
- Store vaccines in appropriate storage units e.g. commercial/pharmacy-grade units are best; residential storage units are not appropriate to store vaccine
- Review your storage and handling policies with all employees
- Identify an emergency relocation site in case of a power outage or storage unit failure





# **Protect Your Vaccine: Protect Your Patients**



# Immunization Program

- Customer Support Services  
(323) 869-8080
- Clinic Support Services  
(213) 351-7800

## Nurse Consultants

- Teri Austin, RN, PHN (SPA 1 & 2)
- Andrew Pourmohsen, RN, PHN (SPA 4, 5, 6, 8)
- Kim Bryant, RN, PHN (SPA 4, 5, 6, 8)
- Suong Gavel, RN, PHN (SPA 3 & 7)



# Post-test & Evaluation

- To receive credit for completing the course, please complete the post-test and evaluation found on the Immunization Program webpage.
- Return the completed post-test and evaluation to Clinic Support Services **Attn: Claudia Davila**. You may return both items via:  
Fax: **(213) 351-2780**, or  
Email: **mdavila@ph.lacounty.gov**



# POST-TEST



# 1. All refrigerated vaccines must be stored at what temperature?

- ☐ 35° – 40°F
- ☐ 40° – 46°F
- ☐ 35° – 36°F
- ☐ 34° – 44°F



## 2. Which storage unit is not recommended for vaccines?

- ☐ Stand-alone refrigerators
- ☐ Stand-alone freezer unit
- ☐ Dormitory style refrigerator and freezer
- ☐ Combination Unit with separate freezer and refrigerator compartments



**3. To maintain stable temperatures during a power outage, the provider should implement the all of the following preventive measures except:**

- ☐ Keep ice packs in freezer
- ☐ Store vaccines in the vegetable bins
- ☐ Keep the refrigerator and freezer doors closed
- ☐ Keep water bottles in the refrigerator



## 4. Vaccines should be stored:

- ☐ Against the walls of the refrigerator
- ☐ On the shelf, stacked on top of each other
- ☐ Away from the walls of the refrigerator or freezer
- ☐ In the vegetable bins of the refrigerator



## 5. Vaccine storage and handling errors may lead to:

- ☐ More cases of vaccine-preventable diseases
- ☐ Loss of patient trust
- ☐ Vaccine loss
- ☐ All of the above



## 6. When should vaccine storage unit temperatures be monitored and recorded?

- ☐ Every morning when the clinic opens
- ☐ Every afternoon
- ☐ Every evening when the clinic closes
- ☐ Every morning when the clinic opens and before closing in the evening



## **7. Benefits of monthly inventory include:**

- ☐ Helps to prevent stocking excessive amounts of vaccine
- ☐ Assists the provider in monitoring vaccine expiration dates
- ☐ Helps ensure that the provider has enough vaccine
- ☐ All of the above



## **8. To be sure the cold chain has not been broken, the following action should be taken.**

- ☐ Check the expiration date upon receipt of the vaccine
- ☐ Assure shipping time is more than 48 hours
- ☐ Check the temperature indicator included in the shipment
- ☐ Leave Varicella in packing until the ice packs melt



## 9. Pre-filling syringes is not recommended as it may lead to:

- ☐ Vaccine wastage
- ☐ Vaccine administration errors
- ☐ Bacterial growth
- ☐ All of the above



**10. Multidose vials must be discarded  
30 days after opening.**

☐ True

☐ False



**11. Storing vaccines in the door of the storage unit is allowed as long as you have water bottles in the door.**

☐ True

☐ False



**12. If you arrive to the clinic in the morning and the refrigerator temperature is 65°F, which of the following would be the most appropriate action to take?**

- ☐ Discard all vaccines stored in the refrigerator.
- ☐ Mark the vaccines “Do Not Use” until the viability can be determined.
- ☐ Transfer the vaccines to another storage unit and continue to use.
- ☐ Shorten the expiration dates of the vaccine and use the vaccine before they expire.



# 13. Vaccines should be stored in their original packaging because:

- ☐ Exposure to light may inactivate the vaccine.
- ☐ It helps keep the vaccine organized
- ☐ It helps to prevent vaccine administration errors
- ☐ All of the above



# **14. Vaccine Coordinators and their back-up are responsible for:**

- ☐ Ordering vaccine
- ☐ Monitoring refrigerator/freezer temperatures
- ☐ Taking a monthly inventory of their vaccine supply
- ☐ All of the above



# 15. What diluent should be used for MMR, MMRV, and Varicella?

- ☐ Sterile water
- ☐ Normal saline
- ☐ Distilled water



# THANK YOU!!!

